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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/737,070	12/14/2000	Mohammed Nafie	TI-30633	8254

23494 7590 03/04/2004

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EXAMINER	
VARTANIAN, HARRY	

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 03/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/737,070	NAFIE ET AL.	
	Examiner	Art Unit	
	Harry Vartanian	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 January 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

Detailed Action

Priority

1. If applicant desires priority under 35 U.S.C. 119e based upon a previously filed application, specific reference to the earlier filed application must be made in the instant application. For benefit claims under 35 U.S.C. 120, 121 or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of the applications. **This should appear as the first sentence of the specification following the title, preferably as a separate paragraph unless it appears in an application data sheet.** The status of nonprovisional parent application(s) (whether patented or abandoned) should also be included. If a parent application has become a patent, the expression "now Patent No. _____" should follow the filing date of the parent application. If a parent application has become abandoned, the expression "now abandoned" should follow the filing date of the parent application.

If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time

period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A priority claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed claim for priority under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a) **because they fail to show equations 1 and 2 as described on page 9 in the specifications. Observing figures 1 and 2, it seems as though variables c and d should be:**

$$c= a\alpha_2-b^* \alpha_1$$

$$d=a^*\alpha_1+b\ \alpha_2$$

Please check and clarify. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 2 recites the limitation "one of the parts..." There is insufficient antecedent basis for this limitation in the claim. A recommended change would be to state "one of the ***first and second parts*** of the further block".

4. Claim 4 recites the limitation "said demodulating step..." in lines 4. There is insufficient antecedent basis for this limitation in the claim.

5. Claim 5 recites the limitation "complex conjugating first and second parts of the received block to produce first and second complex conjugate parts " in lines 10-11. There is insufficient antecedent basis for this limitation in the claim. It is recommended that the applicant first state that the received block is composed of first and second parts before stating the limitation above.

6. Claim 16 recites the limitation "said demodulator..." in line 7. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 17 recites the limitation "said demodulator" in line 10. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claim 17 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. It is unclear as to how an encoder can be part of demodulator. There is also no such clarification in the specifications.

Claim Rejections - 35 USC § 102

> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. Claims 1-3, 5-11, 14-15, and 19-26 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Whinnet et al (US patent #6,317,411). Regarding Claim 1, Whinnet et al meets the following limitations:

> An antenna space time transmit diversity**(Abstract)** method, comprising:
>
> providing an original block of bits having first and second parts; **(fig 3 item 60, look at parts "S_1S_2")**
>
> modulating the original block of bits with a carrier signal to produce a modulated block of information having first and second parts that respectively correspond to said first and second parts of said original block of bits; **(fig 3 item 60)**

producing a further block of information including first and second parts which respectively correspond to the first and second parts of the modulated block and which are respective complex conjugates of the first and second parts of the modulated block; **(fig 3, look at parts "($-S_2*S_1*$)")**

using first and second antennas to respectively transmit the modulated block and **(fig 3, items 34-36)**

the further block over a wireless communication link such that the first part of the modulated block is transmitted in timewise correspondence with the second part of the further block and the second part of the modulated block is transmitted in timewise correspondence with the first part of the further block. **(fig 3 and Column 2, Line 61 to Column 3, Line 10)**

Regarding Claim 2, Whinnet et al meets the following limitations:

wherein one of the parts of the further block is a negative complex conjugate of the corresponding part of the modulated block. **(fig 3 see item "$-S_2*$")**

Regarding Claim 3, Whinnet et al meets the following limitations:

wherein said providing step includes providing the first and second parts of the original block in parallel, and wherein said modulating step includes modulating the first and second parts of the original block in parallel. **(fig 3)**

Regarding Claim 5, Whinnet et al meets the following limitations:

producing a received block of information from the first and second antenna signals; **(Column 6, Line 61 to Column 7, Lines 12)**

complex conjugating first and second parts of the received block to produce first and second complex conjugate parts; and combining the first and second parts and the first and second complex conjugate parts and fading parameter information indicative of first and second estimated fading parameters respectively associated with the first and second antenna signals to produce a combined result that is representative of the original block of bits. **(Column 6, Line 61 to Column 7, Lines 29; Please compare equations in column 7 to equations 1-4 in the application)**

Regarding Claim 6, Whinnet et al meets the following limitations:

wherein the fading parameter information includes a complex conjugate of the first estimated fading parameter and also includes the second estimated fading parameter. **(Column 7, Lines 1-12; fig 2)**

Regarding Claim 7, Whinnet et al meets the following limitations:

wherein said combining step includes multiplying the first and second parts by a complex conjugate of the first estimated fading parameter to produce first and second products, respectively, and **(Column 7, Lines 1-12; fig 2)**

multiplying the first and second complex conjugate parts by the second estimated fading parameter to produce third and fourth products, respectively. **(Column 7, Lines 1-12; fig 2)**

Regarding Claim 8, Whinnet et al meets the following limitations:

wherein said combining step includes adding the first product to the third product to produce a first received part, and subtracting the fourth product from the second product to produce a second received part, said combined result including the first and second received parts. **(Column 7, Lines 1-12; fig 2)**

Regarding Claim 9, Whinnet et al meets the following limitations:

including demodulating the first and second received parts to produce a demodulated result, and making a determination that the demodulated result is the original block of bits. **(Column 7, Lines 1 to Column 8, Line 11 fig 3-4)**

Regarding Claim 10, Whinnet et al meets the following limitations:

wherein said demodulating step includes demodulating the first and second received parts in parallel to produce first and second constituent parts of the demodulated result.**(fig 4)**

Regarding Claim 11, Whinnet et al meets the following limitations:

including formatting the first and second received parts into a further block, said demodulating step including demodulating the further block to produce a demodulated block, said making step including making a determination that the demodulated block is the original block of bits. **(fig 4)**

Regarding Claim 14, Whinnet et al meets the following limitations:

An antenna space time transmit diversity**(Abstract)** apparatus, comprising:

an input for receiving an original block of bits having first and second parts; **(fig 3 item 60 and at parts "S_1S_2")**

a modulator coupled to said input for modulating the original block of bits with a carrier signal to produce a modulated block of information having first and second parts that respectively correspond to said first and second parts of the original block of bits; **(fig 3 item 20, item 60)**

an encoder coupled to said modulator for receiving the modulated block of information and producing therefrom a further block of information including first and second parts which respectively correspond to the first and second parts of the modulated block and which are respective complex conjugates of the first and second parts of the modulated block; and **(fig 3 item 20, item 60)**

first and second antennas respectively coupled to said modulator and said encoder for respectively transmitting the modulated block and the further block over a wireless communication link such that the first part of the modulated block is transmitted in timewise correspondence with the second part of the further block and **(fig 3, items 34-36)**

the second part of the modulated block is transmitted in timewise correspondence with the first part of the further block. **(fig 3)**

Regarding Claim 15, Whinnet et al meets the following limitations:

wherein one of the parts of the further block is a negative complex conjugate of the corresponding part of the modulated block. **(fig 3 see item "$-S_2^*$")**

Regarding Claim 19, Whinnet et al meets the following limitations:

wherein said modulator is operable for modulating the first and second parts of the original block in parallel. **(fig 3 item 20)**

Regarding Claim 20, Whinnet et al meets the following limitations:

A wireless communication apparatus, comprising:

a wireless communication interface for receiving from a wireless communication link first and second antenna signals that represent an original block of bits, said wireless communication interface operable for producing a received block of information from said first and second antenna signals; **(fig 3)**

a complex conjugator coupled to said wireless communication interface for complex conjugating first and second parts of the received block to produce first and second complex conjugate parts; and **(fig 2 and 4)**

a combiner coupled to said complex conjugator and to said wireless communication interface and having an input for receiving fading parameter information indicative of first and second estimated fading parameters respectively associated with the first and second antenna signals, said combiner operable for combining the first and second parts and the first and second complex conjugate parts and the fading parameter information to produce a combined result that is representative of the original block of bits. **(fig 2 - 4 and Column 7, Lines 5-29)**

Regarding Claim 21, Whinnet et al meets the following limitations:

wherein the fading parameter information includes a complex conjugate of the first estimated fading parameter and also includes the second estimated fading parameter. **(Column 7, Lines 5-10)**

Regarding Claim 22, Whinnet et al meets the following limitations:

wherein said combiner includes multipliers for multiplying the first and second parts by a complex conjugate of the first estimated fading parameter to produce respective first and second products and for multiplying the first and second complex conjugate parts by the second estimated fading parameter to produce respective third and fourth products. **(fig 2-4; Column 7, Lines 5-10)**

Regarding Claim 23, Whinnet et al meets the following limitations:

wherein said combiner includes adders coupled to said multipliers for adding the first product to the third product to produce a first received part and for subtracting the fourth product from the second product to produce a second received part, said combined result including the first and second received parts. **(fig 2-4; Column 7, Lines 5-10)**

Regarding Claim 24, Whinnet et al meets the following limitations:

including a demodulator coupled to said adders for demodulating the first and second received parts to produce a demodulated result and for providing the demodulated result as a determination of the original block of bits. **(figs 2-4)**

Regarding Claim 25, Whinnet et al meets the following limitations:

wherein said demodulator is operable for demodulating the first and second received parts in parallel to produce first and second constituent parts of the demodulated result. **(fig 2-4)**

Regarding Claim 26, Whinnet et al meets the following limitations:

including a formatter**(fig 3 item 44)** coupled between said demodulator and said adders for formatting the first and second received parts into a further block, said demodulator operable for demodulating the further block to produce a demodulated block and for providing the demodulated block as a determination of the original block of bits. **(fig 2 -4)**

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 4, 12, 16, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whinnett et al(US Patent# 6317411) in view of Gans et al(US Patent#5,943,372). Regarding Claim 4, Whinnett meets all the limitations of the Claim except for use of FSK demodulator.

However, Gans et al states that in his communication system "The modulation technique used is preferably phase shift keying although other modulation techniques such as amplitude shift keying (ASK) and frequency shift keying (FSK) can be used with a digital data source."(Column 5, Lines 13-20) Moreover, by looking at figures 5 and 6 we see that Gans et al uses FSK in a transmitter diversity system and further states:

> The present invention is preferably used in conjunction with interleaving and deinterleaving and channel coding. The present invention can also be used with other techniques such as spatial diversity to further reduce the effects of fading.**(Column 3, Lines 4-10)**

Therefor, it would have been prima facie obvious to those skilled in the art at the time the invention was made to use FSK demodulation in a communication system using transmitter diversity. The motivation to combine is that FSK is a very common modulation technique used in wireless systems, such as 802.11b and bluetooth standards.

Regarding claims 12, 16, and 27 the argument made above also pertains to these claims.

12. Claims 4, 13, 16, 27 are rejected under 35 U.S.C. 103(a) as being applicants admitted prior art(AAPA) stated in this applicant. On page 4 lines 5-6 the applicant states that the Bluetooth protocol is "incorporated herein by reference". Later on page 5, lines 1-3 the applicant states that GSFK is a commonly "utilized in Bluetooth systems."

13. Claims 18 and 28 are rejected under 35 U.S.C. 103(a) as being applicants admitted prior art(AAPA) stated in this applicant. On page 4 line 5 to page 5 line 3 the applicant discusses transmit diversity as being commonly used in Bluetooth systems and devices

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please consider these documents:

US 6,501,803

US 6,430,231

US 6,587,515

US 6,643,338

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry Vartanian whose telephone number is 703.305.8698. The examiner can normally be reached on 9-5:30 Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703.305.4714. The fax phone number for the organization where this application or proceeding is assigned is 703.872.9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is NONE.

Harry Vartanian
Examiner
Art Unit 2634

HV

STEPHEN CHIN
SUPERVISORY PATENT EXAMINE
TECHNOLOGY CENTER 2600